

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Canceled)
2. (Canceled)
3. (Currently Amended) ~~The [[A]] method of claim 104 transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:  
the transmitter transmitting at least a part of the signal via at least two different transmit antenna paths; and  
the receiver receiving the signal;  
wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path;  
wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths;  
wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements;  
wherein the transmitter forms weighting coefficients using the weighting coefficient data signaling;  
wherein the transmitter forms a quality value for the weighting coefficient data signaling it has received, the quality value for the weighting coefficient data signaling relating to the quality of the channel in which the weighting coefficient data is signaled from the receiver to the transmitter; and  
wherein the transmitter forms weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself.~~
4. (Currently Amended) The method of claim 104 ~~[[3]]~~, wherein the values of the weighting coefficients are predetermined, and the predetermined values of the weighting

coefficients are divided into different groups, each of which has a particular weighting coefficient for each transmit antenna path, the weighting coefficient data signaling comprising information about which group of weighting coefficients the receiver wants to be used the weighting coefficient data signaling controlling the change from one group of weighting coefficients to another group of weighting coefficients.

5. (Currently Amended) The method of claim 104 [[3]], wherein the weighting coefficient data comprises information about the transmit antenna path via which the signal with the best quality value was transmitted.

6. (Currently Amended) The method of claim 104 [[3]], wherein the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially.

7. (Currently Amended) The method of claim 104 [[3]], wherein the weighting coefficient data comprises at least one channel parameter measured by the receiver.

8. (Cancelled)

9. (Currently Amended) The method of claim 103 [[3]], wherein the weighting coefficients used in the transmission are signaled to the receiver.

10. (Previously Presented) The method of claim 9, wherein the weighting coefficients are signaled to the receiver using an identification sequence which is inserted in the transmitted signal and which varies depending on the weighting of the signal.

11. (Previously Presented) The method of claim 9, wherein the weighting coefficients are signaled to the receiver using modulation, spreading or coding of the signal specifically for each transmit antenna path.

12. (Previously Presented) The method of claim 4, wherein identification data for the group of weighting coefficients used in the transmission is signaled to the receiver using identification bits inserted in the transmitted signal.

13. (Currently Amended) ~~The [[A]] method of claim 3, transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:~~  
~~the transmitter transmitting at least a part of the signal via at least two different transmit antenna paths; and~~  
~~the receiver receiving the signal;~~  
~~wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path;~~  
~~wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths;~~  
~~wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements;~~  
~~wherein the transmitter forms weighting coefficients using the weighting coefficient data signaling;~~  
~~wherein the transmitter forms a quality value for the weighting coefficient data signaling it has received;~~  
~~wherein the transmitter forms weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself; and~~  
wherein, when the quality value for signaling falls below a predetermined threshold value, the weighting coefficients are not changed.

14. (Currently Amended) ~~The [[A]] method of claim 3, transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:~~  
~~the transmitter transmitting at least a part of the signal via at least two different transmit antenna paths; and~~  
~~the receiver receiving the signal;~~  
~~wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path;~~  
~~wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths;~~

~~wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements;~~

~~wherein the transmitter forms weighting coefficients using the weighting coefficient data signaling;~~

~~wherein the transmitter forms a quality value for the weighting coefficient data signaling it has received;~~

~~wherein the transmitter forms weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself; and~~

wherein, when the quality value for signaling falls below a predetermined threshold value, the weighting coefficients are set to an equal value over each transmit antenna path.

15. (Currently Amended) The ~~[[A]]~~ method of claim 3, ~~transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:~~

~~the transmitter transmitting at least a part of the signal via at least two different transmit antenna paths; and~~

~~the receiver receiving the signal;~~

~~wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path;~~

~~wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths;~~

~~wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements;~~

~~wherein the transmitter forms weighting coefficients using the weighting coefficient data signaling;~~

~~wherein the transmitter forms a quality value for the weighting coefficient data signaling it has received;~~

~~wherein the transmitter forms weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself; and~~

wherein, when the quality value for signaling exceeds a predetermined threshold value, the weighting coefficients are changed.

16.-25. (Cancelled)

26. (Currently Amended) The method of claim ~~[[3]]~~ 103, wherein a user equipment of the radio system determines the weighting coefficients used by the network part of the radio system in transmitting to the user equipment in question.

27. (Currently Amended) The method of claim ~~[[3]]~~ 103, wherein the network part of the radio system determines itself the weighting coefficients it uses in transmission.

28. (Previously Presented) The method of claim 27, wherein the network part of the radio system takes into account the loading of each power amplifier over the transmit antenna path when it makes the decision.

29. (Currently Amended) The method of claim ~~[[3]]~~ 103, wherein a transmit antenna path is implemented using an antenna structure that provides phasing.

30. (Previously Presented) The method of claim 29, wherein the phasing is determined using channel parameters signaled by the receiver.

31. (Previously Presented) The method of claim 29, wherein the phasing of transmission is determined using signals that have arrived at the same antenna elements.

32. (Currently Amended) The method of claim 29 ~~A method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:~~  
the transmitter transmitting at least a part of the signal via at least two different transmit antenna paths; and  
the receiver receiving the signal;  
wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path,  
wherein a transmit antenna path is implemented using an antenna structure that provides phasing; and

wherein transmissions are sent from at least one antenna element with at least two different phases or antenna beams, such that signals to be transmitted with different phases have different pilot sequences, identification sequences, structures or different coding.

33. (Canceled)

34. (Canceled)

35. (Currently Amended) ~~The [[A]] radio system of claim 106 for transmitting a digital signal, the radio system comprising:~~

~~a transmitter for transmitting a signal;~~

~~at least two transmit antenna paths that can be connected to the transmitter;~~

~~a receiver for receiving the signal;~~

~~wherein the transmitter comprises~~

~~changing means for changing the weighting coefficients determined for each transmit antenna path with respect to one another, and~~

~~weighting means for weighting the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another,~~

~~wherein the receiver comprises means for performing measurements on the received signals that were transmitted via the different transmit antenna paths, and means for signaling to the transmitter the weighting coefficient data formed on the basis of the measurements; and~~

~~the transmitter further comprises means for receiving the weighting coefficient data signaling, and wherein the changing means form weighting coefficients using the weighting coefficient data signaling, and~~

~~wherein the transmitter comprises means for forming a quality value for the weighting coefficient data signaling it has received, the quality value for the weighting coefficient data signaling relating to the quality of the channel in which the weighting coefficient data is signaled from the receiver to the transmitter, and the changing means form weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself.~~

36. (Currently Amended) The radio system of claim ~~[[35]]~~ 106, wherein the values of the weighting coefficients are predetermined, and the predetermined values of the weighting coefficients are divided into different groups, each of which has a particular weighting coefficient determined for each transmit antenna path, the weighting coefficient data signaling comprising information about which group of weighting coefficients the receiver wants to be used, the weighting coefficient data signaling controlling the change from one group of weighting coefficients to another group of weighting coefficients.

37. (Currently Amended) The radio system of claim ~~[[35]]~~ 106, wherein the weighting coefficient data comprises information about the transmit antenna path via which the signal with the best quality value was transmitted.

38. (Currently Amended) The radio system of claim ~~[[35]]~~106, wherein the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially.

39. (Currently Amended) The radio system of claim ~~[[35]]~~106, wherein the weighting coefficient data comprises at least one channel parameter measured by the receiver.

40. (Cancelled)

41. (Currently Amended) The radio system of claim ~~[[35]]~~105, wherein the transmitter comprises means for signaling the weighting coefficients used in the transmission to the receiver using pilot bits inserted in the transmitted signal.

42. (Previously Presented) The radio system of claim 36, wherein the transmitter comprises means for signaling to the receiver identification data for the group of weighting coefficients used in the transmission using pilot bits inserted in the transmitted signal.

43. (Currently Amended) ~~The~~ [[A]] radio system of claim 35, ~~for transmitting a digital signal, comprising:~~  
~~a transmitter for transmitting a signal;~~

~~at least two transmit antenna paths that can be connected to the transmitter;~~  
~~a receiver for receiving the signal;~~  
~~wherein the transmitter comprises:~~  
~~changing means for changing the weighting coefficients determined for each transmit antenna path with respect to one another; and~~  
~~weighting means for weighting the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another;~~  
~~wherein the receiver comprises:~~  
~~means for performing measurements on the received signals that were transmitted via the different transmit antenna paths; and~~  
~~means for signaling to the transmitter the weighting coefficient data formed on the basis of the measurements;~~  
~~wherein the transmitter further comprises:~~  
~~means for receiving the weighting coefficient data signaling, wherein the changing means form weighting coefficients using the weighting coefficient data signaling;~~  
~~means for forming a quality value for the weighting coefficient data signaling it has received, wherein the changing means form weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself; and~~  
~~wherein, when the quality value for signaling falls below a predetermined threshold value, the changing means do not change the weighting coefficients.~~

44. (Currently Amended) [[A]] The radio system of claim 35, for transmitting a digital signal, comprising:

~~a transmitter for transmitting a signal;~~  
~~at least two transmit antenna paths that can be connected to the transmitter;~~  
~~a receiver for receiving the signal;~~  
~~wherein the transmitter comprises:~~  
~~changing means for changing the weighting coefficients determined for each transmit antenna path with respect to one another; and~~  
~~weighting means for weighting the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another;~~



~~wherein the receiver comprises:~~  
~~-means for performing measurements on the received signals that were transmitted via~~  
~~the different transmit antenna paths; and~~  
~~means for signaling to the transmitter the weighting coefficient data formed on the~~  
~~basis of the measurements;~~  
~~wherein the transmitter further comprises:~~  
~~means for receiving the weighting coefficient data signaling, wherein the changing~~  
~~means form weighting coefficients using the weighting coefficient data signaling;~~  
~~means for forming a quality value for the weighting coefficient data signaling it has~~  
~~received, wherein the changing means form weighting coefficients using the quality value of~~  
~~the weighting coefficient data signaling and the signaling itself; and~~  
~~wherein, when the quality value for signaling falls below a predetermined threshold~~  
~~value, the changing means set the weighting coefficients to an equal value over each transmit~~  
~~antenna path.~~

45. (Currently Amended) The ~~[[A]]~~ radio system of claim 35, ~~for transmitting a~~  
~~digital signal, comprising:~~  
~~a transmitter for transmitting a signal;~~  
~~at least two transmit antenna paths that can be connected to the transmitter;~~  
~~a receiver for receiving the signal;~~  
~~wherein the transmitter comprises:~~  
~~changing means for changing the weighting coefficients determined for each transmit~~  
~~antenna path with respect to one another; and~~  
~~weighting means for weighting the transmit power of the signals to be transmitted via~~  
~~different transmit antenna paths using weighting coefficients that can be changed with respect~~  
~~to one another;~~  
~~wherein the receiver comprises:~~  
~~-means for performing measurements on the received signals that were transmitted via~~  
~~the different transmit antenna paths; and~~  
~~means for signaling to the transmitter the weighting coefficient data formed on the~~  
~~basis of the measurements;~~  
~~wherein the transmitter further comprises:~~

~~means for receiving the weighting coefficient data signaling, wherein the changing means form weighting coefficients using the weighting coefficient data signaling;~~

~~means for forming a quality value for the weighting coefficient data signaling it has received, wherein the changing means form weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself; and~~

~~wherein, when the quality value for signaling exceeds a predetermined threshold value, the changing means change the weighting coefficients.~~

46.-52. (Cancelled)

53. (Currently Amended) The radio system of claim [[35]] 105, wherein the user equipment of the radio system comprises means for determining the weighting coefficients used by the network part of the radio system in transmitting to the user equipment in question.

54. (Currently Amended) The radio system of claim [[35]] 105, wherein the network part of the radio system comprises decision-making means for determining the weighting coefficients it uses in transmission.

55. (Previously Presented) The radio system of claim 54, wherein the decision-making means utilize data about the loading of a power amplifier of each transmit antenna path when they make a decision.

56. (Currently Amended) The radio system of claim [[35]] 105, wherein a transmit antenna path is implemented using an antenna structure that provides phasing.

57.-102. (Cancelled)

103. (New) A method of transmitting a digital signal from a transmitter of a base station to a receiver in a radio system, the method comprising:

the transmitter coding the signal with a space-time block code;

the transmitter transmitting the signal via at least two different transmit antenna paths so that a part of the space-time block coded signal is transmitted through each transmit antenna path, the transmit antenna paths being connected to one base station;

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path.

104. (New) The method of claim 103, wherein  
the receiver receives the signal;  
the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths;  
the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements; and  
the transmitter forms weighting coefficients using the weighting coefficient data signaling.

105. (New) A radio system for transmitting a digital signal, comprising:  
a transmitter of a base station for transmitting a signal;  
at least two transmit antenna paths that can be connected to the transmitter;  
a receiver for receiving the signal;  
wherein the transmitter comprises  
means for coding the signal with a space-time block code,  
changing means for changing the weighting coefficients determined for each transmit antenna path with respect to one another, and  
weighting means for weighting the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another so that a part of the space-time block coded signal is transmitted through each transmit antenna path, the transmit antenna paths being connected to one base station.

106. (New) The radio system of claim 105, wherein:  
the receiver comprises means for performing measurements on the received signals that were transmitted via the different transmit antenna paths, and means for signaling to the transmitter the weighting coefficient data formed on the basis of the measurements;  
the transmitter comprises means for receiving the weighting coefficient data signaling, and the changing means form weighting coefficients using the weighting coefficient data signaling.

107. (New) A method of transmitting a digital signal from transmitters of at least two base stations to a receiver in a radio system, the method comprising:

the transmitter transmitting the signal via at least two different transmit antenna paths, the transmit antenna paths being connected to at least two different base stations;

wherein the transmit power of the signals to be transmitted via different transmit antenna paths are weighted with respect to one another in the transmitter using changeable weighting coefficients determined for each transmit antenna path;

wherein the transmitter receives from the receiver weighting coefficient data formed on the basis of measurements performed by the receiver on the received signals, and the transmitter forms weighting coefficients using the weighting coefficient data;

wherein the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially.

108. (New) A radio system for transmitting a digital signal, comprising:  
transmitters of at least two different base stations for transmitting a signal;  
at least two transmit antenna paths that can be connected to the transmitters of at least two different base stations;

a receiver for receiving the signal;

wherein the transmitter comprises

changing means for changing the weighting coefficients determined for each transmit antenna path with respect to one another,

receiving means for receiving from the receiver weighting coefficient data formed on the basis of measurements performed by the receiver on the received signals, and

weighting means for weighting the transmit power of the signals to be transmitted via different transmit antenna paths using weighting coefficients that can be changed with respect to one another, and the weighting means forms weighting coefficients using the weighting coefficient data, wherein the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially.

109. (New) A transmitter of a base station, the transmitter being configured to transmit a digital signal to a receiver in a radio system, the transmitter comprising:

means for coding the signal with a space-time block code; and

means for transmitting the signal via at least two different transmit antenna paths so that a part of the space-time block coded signal is transmitted through each transmit antenna path, the transmit antenna paths being connected to one base station;

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another using changeable weighting coefficients determined for each transmit antenna path.

110. (New) A transmitter of a base station, the transmitter being configured to transmit a digital signal to a receiver in a radio system, the transmitter comprising:  
a channel coder configured to code the signal with a space-time block code; and  
a plurality of transceivers configured to transmit the signal via at least two different transmit antenna paths so that a part of the space-time block coded signal is transmitted through each transmit antenna path, the transmit antenna paths being connected to one base station;

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another using changeable weighting coefficients determined for each transmit antenna path.

111. (New) A transmitter being configured to transmit a digital signal to a receiver in a radio system, the transmitter comprising:

means for transmitting the signal via at least two different transmit antenna paths, the transmit antenna paths being connected to at least two different base stations;

means for weighting the transmit power of the signals to be transmitted via different transmit antenna paths with respect to one another using changeable weighting coefficients determined for each transmit antenna path;

means for receiving from the receiver weighting coefficient data formed based on measurements performed by the receiver on the received signals, and

means for forming the weighting coefficients using the received weighting coefficient data,

wherein the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially.

112. (New) A transmitter being configured to transmit a digital signal to a receiver in a radio system, the transmitter comprising:

a plurality of transceivers configured to transmit the signal via at least two different transmit antenna paths, the transmit antenna paths being connected to at least two different base stations;

transmission power weighting controller configured to weight the transmit power of the signals to be transmitted via different transmit antenna paths with respect to one another using changeable weighting coefficients determined for each transmit antenna path;

at least one transceiver for receiving from the receiver weighting coefficient data formed based on measurements performed by the receiver on the received signals, and

a weighting coefficient formation component configured to form the weighting coefficients using the received weighting coefficient data,

wherein the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially.